HRS DOCUMENTATION RECORD--REVIEW COVER SHEET

Name of Site: Matteo & Sons, Inc.

Contact Persons

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Pathways, Components, or Threats Not Scored

The Surface Water Migration Pathway produces an overall site score above the minimum required for the site to qualify for the National Priorities List; the Ground Water, Soil Exposure, and Air Migration Pathways were not scored because the listing decision is not significantly affected by those pathways.

Ground Water: There is evidence of an observed release to ground water. Samples collected from direct-push locations and on-site monitoring wells indicate that lead, a source contaminant, is present in shallow ground water at concentrations significantly above background. There is a private drinking water well in the home just north of the Matteo facility and other drinking water wells in the area, but there are no documented instances of actual contamination of potable wells. The Ground Water Pathway is not scored because the listing decision is fully supported by the Surface Water Pathway score.

Soil Exposure: In April 2005, EPA collected surface soil samples from residential properties adjacent to the Matteo facility (i.e., the mobile-home park and the Matteo residence). Lead was detected at concentrations as high as 1,520 milligrams per kilogram (mg/kg) in the residential soil samples, and PCBs were also detected in some of the samples. However, the results do not meet the criteria for documenting observed contamination in residential areas. The Soil Exposure Pathway is not scored because it does not contribute significantly to the site score.

Air: The Air Pathway does not contribute significantly to the site score. There is no documentation of a release to air. The Air Pathway is not scored because it does not contribute significantly to the site score.

HRS DOCUMENTATION RECORD

Name of Site: Matteo & Sons, Inc. Date Prepared: February 2006

EPA ID No.: NJD011770013

EPA Region: 2

Street Address of Site*: 1708 U.S. Route 130, Thorofare, New Jersey 08086

County and State: Gloucester County, NJ

General Location in the State: southwestern New Jersey adjacent to Woodbury Creek and Hessian Run

Topographic Map: Woodbury, NJ-PA

Latitude*: 39° 51′ 17.0″ North Longitude: 75° 10′ 5.9″ West

Reference Point: northeast corner of the Matteo facility building

(Ref. 5, pp. 9, 10; 6, p. 1; 8, pp. 1 through 5; 11, p. 1)

* The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

	Scores
Ground Water Pathway	Not Scored
Surface Water Pathway	100.00
Soil Exposure Pathway	Not Scored
Air Pathway	Not Scored
HRS SITE SCORE	50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE
MATTEO & SONS, INC.

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	Not Scored	
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	100.00	10,000.00
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	Not Scored	
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	100.00	10,000.00
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	Not Scored	
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	Not Scored	
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$	10,000.00	
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root	50.00	

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
MATTEO & SONS, INC.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	not scored
2b. Runoff	25	not scored
2c. Distance to Surface Water	25	not scored
2d. Potential to Release by Overland Flow [lines 2a (2b+2c)]	500	not scored
3. Potential to Release by Flood		
3a. Containment (Flood)	10	not scored
3b. Flood Frequency	50	not scored
3c. Potential to Release by Flood (lines 3a x 3b)	500	not scored
4. Potential to Release (lines 2d+3c)	500	not scored
5. Likelihood of Release	550	550
Waste Characteristics		
6. Toxicity/Mobility	*	10,000
7. Hazardous Waste Quantity	*	10,000
8. Waste Characteristics	100	100
Targets		
9. Nearest Intake	50	0
10. Population		
10a. Level I Concentrations	**	0
10b. Level II Concentrations	**	0
10c. Potential Contamination	**	0
10d. Population (lines 10a+10b+10c)	**	0
11. Resources	5	0
12. Targets (lines 9+10d+11)	**	0
13. DRINKING WATER THREAT SCORE ([lines 5 x 8 x 12]/82,500)	100	0.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
MATTEO & SONS, INC.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	*	5.00E+08
16. Hazardous Waste Quantity	*	10,000
17. Waste Characteristics	1,000	1,000
Targets		
18. Food Chain Individual	50	20
19. Population		
19a. Level I Concentrations	**	0
19b. Level II Concentrations	**	0
19c. Potential Human Food Chain Contamination	**	0.003
19d. Population (lines 19a+19b+19c)	**	0.003
20. Targets (lines 18+19d)	**	20.003
21. HUMAN FOOD CHAIN THREAT SCORE ([lines 14 x 17 x 20]/82,500)	100	100

* Maximum value applies to waste characteristics category.
** Maximum value not applicable

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
MATTEO & SONS, INC.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioaccumulation	*	5.00E+08
24. Hazardous Waste Quantity	*	10,000
25. Waste Characteristics	1,000	1,000
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	**	0
26b. Level II Concentrations	**	100
26c. Potential Contamination	**	not scored
26d. Sensitive Environments (lines 26a+26b+26c)	**	100
27. Targets (line 26d)	**	100
28. ENVIRONMENTAL THREAT SCORE ([lines 22 x 25 x 27]/82,500)	60	60
29. WATERSHED SCORE (lines 13 + 21 + 28)	100	100
30. SW: OVERLAND/FLOOD COMPONENT SCORE (S_{of})	100	100
SURFACE WATER MIGRATION PATHWAY SCORE (S_{sw})	100	100

* Maximum value applies to waste characteristics category.
** Maximum value not applicable

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INTRODUCTION

The Matteo & Sons Inc. (Matteo) site (EPA ID No. NJD011770013) consists of three sources (waste pile, landfill, and contaminated soil) and contaminated sediments in two streams bordering the subject property (see ensuing discussion). The site address is 1708 U.S. Highway 130, Thorofare, Gloucester County, New Jersey (Ref. 11, p. 1), which consists of property currently used by the owner (Matteo) as a scrap metal recycling facility (Ref, 7. p. 12; 8, p. 1). The Matteo property consists of a metals recycling operation, a junkyard, and an inactive landfill (Ref. 3, p. 73; 7, p. 12; 22, pp. 9, 10, 99). The Matteo facility is not subject to RCRA regulations (Ref. 29, pp. 1 through 6). The southeastern portion of the property (approximately 5 acres) is largely paved with asphalt, and contains several buildings that support the scrap metal recycling business (Ref. 7, pp. 26, 27, 40 through 43, 100 through 104, 189). The remainder of the property (approximately 75 acres) consists predominantly of heavily vegetated, undeveloped land that borders Woodbury Creek to the west, Hessian Run to the north, and a residential mobile home park to the south (Ref. 8, pp. 1 through 5). Additionally, two utility lines (Colonial Oil and PSE&G) are located in the northwestern portion of the property (Ref. 3, pp. 13, 15, 64, 71; 22, p. 36).

Matteo Facility History

The Matteo family acquired the subject property in 1947 and has operated an unregistered landfill, junkyard, and metals recycling facility on the property under various names (James Matteo & Sons, Inc.; Matteo Trucking Company; Thorofare Trucking and Trash Company; Matteo Iron and Metal) since at least 1961 (Ref. 7, p. 12; 8, p. 2; 22, p. 8). In 1971, the New Jersey Department of Environmental Protection (NJDEP) approved Matteo's request to operate an incinerator to burn copper wire and Matteo submitted a plan to the NJDEP to operate a “sweating fire box” to melt lead battery terminals for lead reclamation (Ref. 7, p. 12; 22, pp. 88 through 95). In conjunction with the lead melting operation, Matteo dumped crushed battery casings in an area of wetlands adjacent to Hessian Run (Ref. 7, p. 12; 22, pp. 9, 99). There have been several reports of battery casing incineration and subsequent ash disposal on the Matteo property (Ref. 7, p. 12; 22, pp. 10, 78, 86). In January 1984, NJDEP issued an Administrative Consent Order (ACO) to Matteo for solid waste violations and required Matteo to cease waste disposal at the facility (Ref. 22, pp. 11, 139 through 143).

A review of historical aerial photographs and topographic maps indicates that the junkyard operation (scrap vehicles and associated structures) had begun in the northeastern portion of the property by 1951, and that a large pile of dark debris had appeared in that area by 1959 (Ref. 7, pp. 12, 13, 213 through 218; 30, pp. 1 through 11). A 1965 aerial photograph revealed the presence of a large landfill area and dark debris extending into Hessian Run in the north portion of the Matteo property (Ref. 7, p. 217). In a 1975 aerial photograph, the piles of dark debris were no longer visible, but the shoreline had extended into Hessian Run along the northern boundary of the Matteo property. The northwestern portion of the property appeared as an active disturbed area with light and dark soil present (Ref. 7, p. 218).

Site Investigations

Matteo (under NJDEP oversight), NJDEP, and the U.S. Environmental Protection Agency (EPA) have all conducted investigations at the subject property (Ref. 7, all pages; 22, all pages). Lead has been found to be the primary contaminant of concern in the surface soils, surface waters, sediments, and ground water on the property and in its immediate surroundings. PCB contamination has also been identified in some of the surface soils and sediments (Ref. 7, pp. 13, 14, 56 through 60, 95 through 170). Additionally, a geophysical survey was conducted and test pits were excavated to investigate the nature and extent of the landfilled waste materials (Ref. 7, pp. 129 through 133, 140, 141, 382 through 474).

NJDEP (and the contractor, the Louis Berger Group (LBG)) conducted State-lead Remedial Investigation (NJDEP RI) field sampling at the Matteo property and surrounding environs from September 2000 to October 2002 (Ref. 7, all pages). The NJDEP RI analytical results document the presence of lead and PCBs in waste sources and in sediment

samples collected from Hessian Run and Woodbury Creek (Ref. 7, pp. 34 through 36, 50, 51, 153 through 163, 199 through 204). NJDEP also reported that lead concentrations in surface water samples collected during the RI exceeded the NJDEP Surface Water Quality Standards (SWQS) (Ref. 7, p. 51). All sampling and investigation activities performed during the RI were done in accordance with the New Jersey Technical Requirements for Site Remediation, (NJDEP, 1997), the New Jersey Field Sampling Procedures Manual (NJDEP, 1992) and, where applicable, other relevant or appropriate US EPA regulation and guidance. Chemical analysis of the samples were performed using EPA Contract Laboratory Program procedures and using the same detection limits. The steps taken to validate the chemical analyses are discussed in this document where the data is presented. For HRS scoring purposes, the validated analytical data are considered equivalent quality as CLP data (Ref. 58).

Woodbury Creek is known to be used as a fishery (Ref. 9, pp. 1058, 1059; 14, pp. 1 through 3; 16, p. 1; 23, p. 152). The contamination also affects approximately 0.16 mile of wetland frontage in Hessian Run, and a bald eagle foraging habitat within Hessian Run and Woodbury Creek (Ref. 15, pp. 1, 2; 24, p. 1; 25, Figures 4 and 5). EPA confirmed the on-site lead and PCB contamination in April 2005, and also documented flooding of source areas known to contain those hazardous substances (Ref. 3, pp. 4 through 20, 23 through 49; 12, pp. 2, 6, 16, 23; 25, Figures 2 and 3; 26, pp. 54, 57, 63; 27, pp. 39, 40, 43, 45, 46; 29, pp. 1, 2).

Note: The PCB concentration presented in this documentation record represent the sum of all PCB Aroclor mixes that were analyzed for and calculated to be above the appropriate detection limit. The number of Aroclors analyzed for varied by study, but comparisons between background and release or source samples were only made among samples from the same study.

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 1

Name and description of the source: Battery Casing Waste Pile

Source Type: Pile

Source 1 is a waste pile where Matteo discarded crushed lead battery casings along the northern boundary of the subject property (Ref. 22, pp. 9, 99; 25, Figure 3). This source is characterized by the predominant presence of crushed battery casings, batteries, and minor amounts of miscellaneous other wastes in two separate areas with no soil cover (Ref. 7, pp. 192, 205, 206, 382, 383, 385, 386, 388, 390, 396, 400 through 404, 415, 418, 422, 423, 425, 427 through 429, 439, 448; 15, p. 1; 25, Figure 3). The total area where crushed battery casings are present at the ground surface is approximately 224,000 square feet (Ref. 15, p. 1). The hazardous substance associated with Source 1 is lead (Ref. 7, pp. 12, 205, 206; 25, Figure 3).

In 1971, Matteo submitted a plan to the NJDEP to operate a "sweating fire box" to melt lead battery terminals for lead reclamation (Ref. 22, pp. 89, 91). This lead melting operation continued until 1985 (Ref. 7, p. 12; 22, p. 71). In 1972, the NJDEP observed piles of crushed battery casings in an area of wetlands adjacent to Hessian Run, along the northern boundary of the Matteo property (Ref. 22, pp. 9, 99). This dumping activity was apparently performed in conjunction with the lead melting operation (Ref. 7, p. 12). Historical aerial photographs revealed the possible presence of battery casings (dark debris) in the northeast portion of the property since 1959. By 1975, the northern boundary of the pile extended into Hessian Run (Ref. 7, pp. 12, 13, 213 through 218). Waste materials deposited in the battery casing waste pile area include: batteries, battery casings, household waste, fabric, metal, glass, tires, and wood (Ref. 7, pp. 205, 206, 382, 383, 385, 386, 388, 390, 396, 400 through 404, 415, 418, 422, 423, 425, 427 through 429, 439, 448). Observations made in April 2005 by EPA staff and by its contractors confirmed that the northern boundary of the Matteo property consists of piles of crushed battery casings, visible at ground surface, and that the northern boundary of the waste pile is in contact with Hessian Run (Ref. 3, pp. 5, 6, 7, 12, 20, 53, 59 through 61). There are no flood containment measures present at the facility and it appeared as though some of the crushed battery casings have been transported by Hessian Run to the center of the channel which is visible at low tide (Ref. 3, pp. 5, 6, 7, 12, 13, 20, 53, 59 through 61). The battery casing waste pile is situated within emergent wetlands along most of the northern boundary of the property (Ref. 3, pp. 53, 59 through 61; 25, Figure 3). Although the operations portion of the Matteo facility is fenced, access can be obtained through a network of trails which connect the adjacent Willow Woods Trailer Park to the northwestern portion of the property (Ref. 3, pp. 18 through 35, 67; 7, p. 180; 25, Figure 2).

Location of the source, with reference to a map of the site: (See Reference 25, Figure 3)

The battery casing waste pile (Source 1) is located along the northern boundary of the Matteo and Sons, Inc. property; it has displaced the southern bank of Hessian Run (Ref. 3, pp. 5, 6, 7, 12, 13, 20, 53, 59 through 61; 7, pp. 205, 206). The waste pile is situated within the 100-year floodplain of the Woodbury Creek and Hessian Run (Ref. 4, pp. 1, 2, 3).

Containment

Release to ground water:

Not Scored

Containment (continued)

Release to surface water via overland migration:

On April 4, 5, and 15, 2005 and May 12, 2005, the battery casings waste pile was observed in direct contact with Hessian Run along the northern boundary of the Matteo property, and battery casings were observed to be in the water body (Ref. 3, pp. 5, 6, 7, 12, 13, 20, 53, 56, 59 through 61). Based on this evidence that the source is located in surface water, an overland flow containment factor of 10 is assigned (Ref. 1, p. 51609).

Release to surface water via flood:

Observations made in April 2005 by EPA staff and by its contractors confirmed that the northern boundary of the Matteo property consists of piles of crushed battery casings, visible at ground surface, and that the northern boundary of the waste pile is in contact with Hessian Run (Ref. 3, pp. 5, 6, 7, 12, 20, 53, 59 through 61). There are no flood containment measures present at the facility and it appeared as though some of the crushed battery casings have been transported by Hessian Run to the center of the channel which is visible at low tide (Ref. 3, pp. 5, 6, 7, 12, 13, 20, 53, 59 through 61). The battery casing waste pile is situated within emergent wetlands along most of the northern boundary of the property (Ref. 3, pp. 53, 59 through 61; 25, Figure 3).

Based upon direct observation of Hessian Run flood waters in contact with the battery casing waste pile and a lack of containment measures designed, constructed, operated, and maintained to prevent a washout of hazardous substances by flooding, a flood containment factor of 10 is assigned (Ref. 1, Table 4-2, p. 51609, Table 4-8, p. 51611; 3, pp. 5, 6, 7, 20, 53, 59 through 61; 7, pp. 28, 43 through 45, 129 through 133, 140, 141, 192, 205; 9, pp. 444, 447, 534, 536, 581, 601, 603, 650, 657, 658, 661, 800, 946, 972 through 976, 1002 through 1006, 1198 through 1200, 2490).

2.4.1 Hazardous Substances

During the NJDEP RI sampling event in September and October 2000, LBG collected 23 surface (depth<2 feet) and subsurface (depth>2 feet) soil samples from 23 sample locations (TP1A, TP1B, TP2A, TP3A, TP4A, TP4C, TP9A, TP13A, TP14A, TP15, TP16, TP17, TP28, TP31, TP35, TP36, TP38, TP40 through TP-42, TP51, TP-52, and TP64), including two environmental duplicate samples, from the battery casing waste pile adjacent to Hessian Run (Ref. 7, pp. 28, 43 through 45, 129 through 131, 192; 9, pp. 5, 7, 13, 20, 37, 42, 46, 50, 52, 53, 169, 201, 216, 254, 260, 271, 348, 374; 23, pp. 5, 10, 11, 13, 14, 23, 48, 56, 59, 62, 74). Samples were collected at depths ranging from 1.5 feet below ground surface (bgs) to 7.5 feet bgs, and consisted of mostly sand, silt, and clay (Ref. 9, pp. 382, 383, 385, 386, 388, 390, 396, 415, 422, 425, 428, 438; 23, pp. 5, 10, 11, 13, 14, 23, 48, 56, 58, 62, 74). Each of these test pit sample locations is characterized by the presence of crushed battery casings (Ref. 7, pp. 205, 206, 382, 383, 385, 386, 388, 390, 396, 400 through 404, 415, 418, 422, 423, 425, 427 through 429, 439, 448). Background soil samples were collected from locations GP-22 and TP-50 immediately outside the influence of facility operations, west of the former junkyard and current metals recycling facility, in the southern portion of the property (Ref. 7, pp. 102, 138, 189; 9, pp. 327, 1348; 23, pp. 72, 292). Soil samples were collected from the background locations at depths ranging from 0 to 14 feet bgs, and consisted of mostly sand and silt materials (Ref. 9, p. 437; 23, pp. 72, 292). Test pit soil samples were analyzed for pH, Total Petroleum Hydrocarbons (TPH), and Target Analyte List (TAL) lead, however, if elevated PID readings, visible staining, noticeable odor, or unusual waste material were encountered, Target Compound List (TCL) Volatiles, Semi-Volatiles, and Pesticides/PCBs and TAL Metals analyses were conducted (Ref. 7, p. 28). Inorganic analyses were conducted in accordance with CLP SOW ILM04.0 (Ref. 9, pp. 1662, 1664, 1666, 1669, 1670, 1673, 1674, 1676, 1678, 1683, 1686, 1688, 1689, 1691, 1692, 1696, 1698, 1703, 1707).

The NJDEP RI analytical data used in the HRS evaluation were evaluated according to EPA data validation guidelines (Ref. 19, pp. 3, 4). As shown below, the validated analytical results for samples TP-1A, TP-1B/TP-DUP1, TP-2A, TP-3A, TP-4A, TP-4C and TP-9A indicated the presence of lead at concentrations significantly above background (Ref. 7, pp. 129, 131; 9, pp. 5, 7, 20, 37, 42, 46, 50).

Hazardous Substance	Evidence	Reference(s)
Lead	Test pit samples, LBG, Sept. and Oct. 2000:	
(max: 31,300 mg/kg)	TP-1A, TP-1B/TP-DUP1, TP-2A, TP-3A, TP-4A, TP-4C, TP-9A	7, pp. 129, 131; 9, pp. 5, 7, 20, 37, 42, 46, 50; 19, p. 3; 37, pp. 4, 7; 38, pp. 2, 4, 16, 17
(max validated bg: 85.5 mg/kg)	GP-22A, GP-22B, GP-22C	7, p. 102, 116, 123; 9, p. 1731, 1732, 1733; 19, p. 4; 43, pp. 3, 4, 8, 9

In addition to samples listed above, LBG collected soil samples TP-28A, TP-35, TP-38, TP-41, and TP-51A in the area of the battery casing waste pile in September and October 2000 (Ref. 7, pp. 129, 130, 131; 9, pp. 201, 214, 254, 260, 348). The samples were collected at depths ranging from 2.0 feet bgs to 6.5 feet bgs and revealed lead contamination ranging between 1,650 mg/kg and 11,500 mg/kg (Ref. 7, pp. 129, 130, 131; 9, pp. 201, 214, 254, 260, 348). In addition, background sample TP-50 showed a maximum background concentration of lead of 104 mg/kg (Ref. 7, p. 138; 9, p. 311; 42, p. 3) These results support the presence of lead in source 1.

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored (NS).

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to evaluate Tier B source hazardous waste quantity; therefore, hazardous wastestream quantity is not scored (NS).

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Volume

The information available is not sufficient to evaluate Tier C source hazardous waste quantity; therefore, volume (V) is assigned a value of 0 (Ref. 1, p. 51591, Section 2.4.2.1.3).

Volume (V) Value: 0

2.4.2.1.4 Area

Source 1 is a waste pile where Matteo discarded crushed battery casings along the northern boundary of the subject property (Ref. 22, pp. 9, 99; 25, Figure 3). This source is characterized by the presence of crushed battery casings, batteries, and miscellaneous other wastes in two separate areas (Ref. 7, pp. 192, 205, 206, 382, 383, 385, 386, 388, 390, 396, 400 through 404, 415, 418, 422, 423, 425, 427 through 429, 439, 448; 15, p. 1; 25, Figure 3). The waste pile occupies an area of 224,120 square feet (Ref. 7, pp. 28, 43 through 45, 205; 15, p. 1). The source type is Pile, so the area value is divided by 13 to obtain the assigned value, as shown below (Ref. 1, p. 51591, Section 2.4.2.1.4, Table 2-5).

Area of source (ft^2): 224,120

Area (A) Assigned Value: (224,120)/(13) = 17,240

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is 17,240 for Tier D - Area (Ref. 1, p. 51591, Section 2.4.2.1.5).

Source Hazardous Waste Quantity Value: 17,240

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 2

Name and description of the source: Inactive Landfill

Source Type: Landfill

Source 2 is a dumping area (i.e., landfill) where Matteo disposed of waste material to a depth of at least 5 feet in the north-central portion of the site; the waste material is mostly covered or mixed with soil, with some waste exposed at the ground surface (Ref. 3, pp. 26, 62, 63; 7, pp. 28, 43 through 45, 192, 205, 206, 384, 414, 417, 421, 424, 431, 432, 438, 442, 444, 453 through 457, 463 through 466, 471, 472; 22, pp. 10, 113, 126, 132; 25, Figure 3). Waste materials deposited in the three landfill portions of the Matteo property include roof shingles, wood, drums, plastic, lumber, glass, rubber, construction materials, metal debris, rubber, household trash, tires, batteries, and white and yellow residue and powder (Ref. 7 pp. 192, 384, 414, 417, 421, 424, 431, 432, 438, 442, 444, 453 through 457, 463 through 466, 471, 472). The hazardous substances associated with Source 2 are lead and PCBs (Ref. 7, pp. 12, 205, 206; 25, Figure 3).

A historical aerial photograph from 1965 documents the presence of the large landfill area in the north-central portion of the Matteo property at that time (Ref. 7, pp. 12, 13, 213 through 218). In October 1972, Matteo submitted an application to conduct the refuse disposal operation; however, the application was withdrawn in December of the same year (Ref. 22, pp. 9, 102, 103, 111). In January 1973, the NJDEP filed a solid waste disposal area survey and reported that Matteo had covered over the landfill portion of the property (Ref. 22, p. 113). In January 1984, the NJDEP issued an Administrative Consent Order (ACO) to Matteo Iron and Metal for solid waste violations and required Matteo to cease waste disposal at the facility (Ref. 7, p. 12; 22, pp. 11, 138 through 143). Observations made by EPA staff and Contractors at the Matteo property indicate that the waste materials deposited in the landfill are both hazardous and non-hazardous wastes intertwined in the roots of fallen trees; the area is mostly covered with soil with some exposed waste (Ref. 3, pp. 26, 62, 63; 7, pp. 384, 414, 417, 421, 424, 431, 432, 438, 442, 444, 453 through 457, 463 through 466, 471, 472). The excavation of test pits by LBG during the NJDEP RI provide soil and waste profiles defining where landfill operations occurred on the property (Ref. 7, pp. 28, 43 through 45, 192, 205, 206). A site walk was completed after a major rain event and the landfill portion of the property was observed to be flooded (Ref. 3, pp. 7, 25, 62, 63). There are no flood containment measures present at the facility as the cross section of fill material shows waste material directly in contact with underlain soil (Ref. 7, pp. 205, 206). Although the operations portion of the Matteo facility is fenced, access can be obtained through a network of trails which connect the Willow Woods Trailer Park to the northwestern portion of the property (Ref. 3, p. 67).

Location of the source, with reference to a map of the site: (See Reference 25, Figure 3)

The inactive landfill portion of the Matteo property is situated within the 100-year floodplain of the Woodbury Creek and Hessian Run (Ref. 4, pp. 1 through 3). There are three individual landfill areas located on the property for which the presence of waste material and contaminants are documented by surface (depth<2 feet) and subsurface (depth>2 feet) soil samples collected by LBG for the NJDEP during September and October 2000 and October 2001 (Ref. 7, pp. 28, 43 through 45, 129 through 133, 140, 141, 192; 9, pp. 13, 240, 272, 426, 507, 1478, 1513; 23, pp. 6, 66, 93, 94, 128; 34, p. 9). The landfill areas are located: in the northern central portion of the property extending from the southern boundary of the battery casing waste pile to approximately 100 feet north of the property access road; along the northern boundary of the northwest corner of the property just south of the battery casing waste pile; and along the western boundary of the property extending from the northern portion of the property past the central portion of the property (Ref. 7, pp. 205, 206; 25, Figure 3).

Containment

Release to ground water:

Not Scored

Release to surface water via overland migration:

Contaminants were detected in surface soils collected from the Source 2 area, providing evidence that there is not a maintained engineered cover (Ref. 7, pp. 23, 28, 39, 40, 43 through 45, 95 through 99, 129 through 133, 140, 141, 192, 205, 206, 384, 432, 467; 9, pp. 9, 237, 269, 420 through 423, 426, 502, 503, 507, 1252, 1473, 1510; 23, pp. 92, 94, 128; 34, p. 9). There is also no evidence of a maintained run-on control system and runoff management system at the site (Ref. 3, pp. 12 through 14; 7, pp. 205, 206). Therefore, the overland flow containment factor value for this source in the surface water migration pathway is 10 (Ref. 1, Table 4-2, p. 51609).

Release to surface water via flood:

On April 5, 2005, observations made by EPA contractors at the Matteo property indicate that the waste materials deposited in the landfill are both hazardous and non-hazardous wastes intertwined in the roots of fallen trees; the area is mostly covered with soil with some exposed waste (Ref. 3, pp. 26, 62, 63; 7, pp. 384, 414, 417, 421, 424, 431, 432, 438, 442, 444, 453 through 457, 463 through 466, 471, 472). The excavation of test pits by LBG during the NJDEP RI provide soil and waste profiles defining where landfill operations occurred on the property (Ref. 7, pp. 28, 43 through 45, 192, 205, 206). A site walk was completed after a major rain event and the landfill portion of the property was observed to be flooded (Ref. 3, pp. 7, 25, 62, 63). There are no flood containment measures present at the facility as the cross section of fill material shows waste material directly in contact with underlain soil (Ref. 7, pp. 205, 206).

Based upon the observation of flood waters of Hessian Run and Woodbury Creek in direct contact with the inactive landfill portion of the site; and lack of containment measures designed, constructed, operated, and maintained to prevent a washout of hazardous substances by flooding, a flood containment factor of 10 is assigned (Ref. 1, Table 4-2, p. 51609, Table 4-8, p. 51611; 3, pp. 12 through 14; 7, pp. 205, 206).

2.4.1 Hazardous Substances

The excavation of test pits by LBG during the NJDEP RI provided soil and waste profiles defining where landfill operations occurred on the property (Ref. 7, pp. 28, 43 through 45, 192, 205, 206). The waste materials encountered in this area included crushed drums and other industrial waste (Ref. 7, pp. 384, 432, 467). Subsurface samples from test pits show that lead and PCBs are both associated with this source (see below). While it is not clear whether all or part of the lead and PCBs came to be located in surface soil through deposition of waste materials during landfill operations or by some other means such as surface spreading, EPA considers it reasonable to assume that the majority of it in this area is a result of the landfilling operation. Therefore, all surface soil samples that were collected within the lateral extent of the landfill areas are evaluated as hazardous substance evidence for Source 2, and not as part of source 3, contaminated soil in other parts of the site.

As part of the NJDEP RI completed by LBG, 21 surface (depth<2 feet) and subsurface (depth>2 feet) soil samples from 21 test pits (TP-1C, TP-27, TP-30, TP-34, TP-37, TP-44, TP-45, TP-51, TP-55, TP-60, TP-69 through TP-73, TP-78 through TP-80, TP-85 and TP-86), were collected from the inactive landfill areas during the NJDEP RI sampling event in September, October, and November 2000 and October 2001 (Ref. 7, pp. 28, 43 through 45, 129 through133, 140, 141, 192; 9, pp. 13, 240, 272, 1478, 1513; 23, pp. 6, 66; 34, p. 9). Each of these test pit sample locations is characterized by the presence of mixed hazardous and non-hazardous substances mainly covered with soil (Ref. 7, pp. 384, 414, 417, 421, 424, 431, 432, 438, 442, 444, 453 through 457, 463 through 466, 471, 472). Samples were collected from depths ranging from 0 feet bgs to 4.5 feet bgs of mostly sand silt and gravel (Ref. 9, pp. 384, 432, 467, 472; 23, pp. 6, 66, 93, 94, 128; 34, p. 9). Test pit soil samples were analyzed for pH, TPH, and TAL lead, however, if elevated PID readings, visible staining, noticeable odor, or unusual waste material were encountered, TCL Volatiles, Semi-Volatiles, and Pesticides/PCBs and TAL Metals were conducted (Ref. 7, p. 28).

LBG also collected surficial soil samples throughout the Matteo property in September and October 2000 and in February 2001 to characterize PCB concentrations (Ref. 7, pp. 23, 39, 40, 95 through 99; 9, pp. 426, 507; 23, pp. 92, 94, 128; 34, p. 9). Two of these samples (PB12W6A, PB12S3A) can be used to characterize surficial contamination of PCBs in the landfill area of the property (Ref. 7, p. 98; 9, pp. 420 through 423, 502, 503). Background soil samples were collected from locations GP-22 and TP-50 immediately outside the influence of facility operations, west of the former junkyard and current metals recycling facility, in the southern portion of the property (Ref. 7, pp. 102, 138, 189; 9, pp. 327, 1348; 23, pp. 72, 292). Soil samples were collected from the background locations at depths ranging from 0 to 14 feet bgs, and consisted of mostly sand and silt materials (Ref. 9, p. 437; 23, pp. 72, 292). Organic analyses were conducted in accordance with CLP Statement of Work (SOW) OLM04.2; inorganic analyses were conducted in accordance with CLP SOW ILM04.0 (Ref. 9, pp. 1662, 1671 through 1677, 1681, 1684, 1713 through 1716). Analytical data were evaluated according to EPA data validation guidelines (Ref. 19, p. 4; 20, p. 1).

As shown below, the validated analytical results for samples TP-1C and TP-81A indicated the presence of lead at concentrations significantly above background (Ref. 7, pp. 129, 133; 9, pp. 9, 1473; 19, p. 4). The validated analytical results for PB12W6A and PB12S3A indicated the presence of PCBs at concentrations significantly above background (Ref. 7, pp. 98, 133; 9, pp. 420 through 423; 19, p. 4; 20, p. 1).

Hazardous Substance	Evidence	Reference(s)
Lead	Test Pit Samples, LBG, Sept. 2000 and Oct. 2001:	
(max: 12,000 mg/kg)	TP-1C, TP-81A	7, pp. 129, 133; 9, pp. 9, 1473; 19, p. 3; 37, pp. 4, 7; 47, pp. 3, 5, 19
(max validated bg: 85.5 mg/kg)	GP-22A, GP-22B, GP-22C	7, p. 102, 116, 123; 9, pp. 1731, 1732, 1733; 19, p. 4; 43, pp. 3, 4, 8, 9

In addition to samples listed above, LBG collected sample TP-45A in the area of the former landfill in September 2000. The sample was collected at a depth of 1.5-2 feet bgs and revealed lead contamination at 24,300 mg/kg. Background sample TP-50 contained the maximum background concentration for lead of 104 mg/kg (Ref. 7, p. 139; 9, p. 311; 42, p. 3).

PCBs **	Test Pit and Surface Soil Samples, LBG, Sept. and Oct. 2000 and Oct. 2001	
(max validated: 49 mg/kg)	PB12W6A, PB12S3A	7, p. 98; 9, pp. 420 through 423; 20, pp. 1, 3, 4
(max bg: 0.049 J* mg/kg (0.49))	GP-22A, GP-22B, GP-22C	7, p. 102, 116, 123; 9, pp. 1344, 1345, 1346; 19, p. 4; 43, pp. 3, 4, 7

* This value is qualified as estimated "J" because the percent difference between analytical column results exceeded 25% but was less than 100% (Ref. 43, p. 7). The lower of the two values was reported, per method convention (Ref. 43, p. 7). This indicates a potential low bias; therefore, to consider the possibility that the reported concentration may be biased low, EPA has projected the actual value to be possibly as high as 0.49 mg/kg (presented in parentheses following the reported value. *(See* EPA Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination)* If this "adjusted value" is used in the HRS evaluation instead of the reported value, the contaminant concentration in the source samples would still be considered significantly greater than those in the background samples. (While the method of considering possibly biased analyses was developed for use when establishing an observed release or observed contamination, because the procedures used in the analysis of the samples is the same for source samples as for release samples, EPA considers the possible variation in the sample concentration to be similar in either case.)(Ref. 57, pp. 4, 5, 6, 8, 16).

**The PCB concentration presented in this documentation record represent the sum of all PCB Aroclor mixes that were analyzed for and calculated to be above the appropriate detection limit. The number of Aroclors analyzed for varied by study, but comparisons between background and release or source samples were only made among samples from the same study.

In addition to samples listed above, LBG collected samples S34N3B and TP-86A in the area of the former landfill on October 2000 and October 2001, respectively (Ref. 7, pp. 97, 133; 9, pp. 502, 503, 1510). Sample TP-86A was collected at a depth of 4.5-5 feet bgs and revealed PCB contamination at 460 mg/kg and sample S34N3B was collected at 1-1.5 feet bgs and revealed PCB contamination at 10.5 mg/kg (Ref. 7, pp. 97, 133; 9, pp. 502, 503, 1510).

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored (NS).

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to evaluate Tier B source hazardous waste quantity; therefore, hazardous wastestream quantity is not scored (NS).

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Volume

The information available is not sufficient to evaluate Tier C source hazardous waste quantity; therefore, volume (V) is assigned a value of 0 (Ref. 1, p. 51591, Section 2.4.2.1.3).

Volume (V) Value: 0

2.4.2.1.4 Area

Source 2 is a dumping area (i.e., landfill) where Matteo disposed of waste material to a depth of at least 5 feet in the north-central portion of the site (Ref. 7, pp. 28, 43 through 45, 192, 205, 206; 22, pp. 10, 126, 132; 25, Figure 3). Waste materials deposited in the three landfill portions of the Matteo property include roof shingles, wood, drums, plastic, lumber, glass, rubber, construction materials, metal debris, rubber, household trash, tires, batteries, and white and yellow residue and powder (Ref. 7 pp. 192, 384, 414, 417, 421, 424, 431, 432, 438, 442, 444, 453 through 457, 463 through 466, 471, 472). The inactive landfill occupies an area of 259,577 square feet (Ref. 7, pp. 28, 43 through 45, 205; 15, p. 1). The source type is Landfill, so the area value is divided by 3,400 to obtain the assigned value, as shown below (Ref. 1, p. 51591, Section 2.4.2.1.4, Table 2-5).

Area of source (ft^2): 259,577

Area (A) Assigned Value: (259,577)/(3,400) = 76.3

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is 76.3 for Tier D - Area (Ref. 1, p. 51591, Section 2.4.2.1.5).

Source Hazardous Waste Quantity Value: 76.3

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 3

Name and description of the source: Contaminated Soil

Source Type: Contaminated Soil

Source 3 consists of contaminated soil. The contaminated soil is defined by contaminated surface (depth<2 feet) soil samples collected by LBG in September 2000, October 2001, and April, June, and September 2002 and by EPA in April 2005 (Ref. 3, pp. 7, 12 through 14, 25, 26, 62, 63; 7, pp. 26, 27, 40 through 43, 100 through 104, 189; 10, pp. 1, 4). The contaminated soil is located throughout the Matteo property (Ref. 7, pp. 26, 27, 40 through 43, 100 through 104, 189). According to available records, the Matteo Family has operated an unregistered landfill, junkyard, and metals recycling facility at the property since 1951 (Ref. 7, p. 12). The eastern portion of the property is currently used as a scrap metal recycling facility (Ref, 7. p. 12). For scoring purposes, this area does not include surface contamination in Source 2 as explained in the description of that source, because it is unclear if some or part of the contamination came from migration or deposition related to the landfill activity.

Although a portion of the operations area (located in the eastern portion of the facility) is paved, the outlying areas are not, and scrap metal waste piles are currently stored directly on the ground in the northeastern parts of the contaminated soil area (Ref. 3, p. 10). Although the operations portion of the facility is fenced from Crown Point Road, access can be obtained through a network of trails through the inactive landfill which connect the Willow Woods Trailer Park, adjacent to the southwestern boundary of the Matteo property, Hessian Run adjacent to the northern boundary of the property, and Woodbury Creek adjacent to the northwestern boundary of the property (Ref. 3, p. 67; 25, Figure3).

Location of the source, with reference to a map of the site:

The contaminated soil is located throughout the Matteo property (Ref. 7, pp. 26, 27, 40 through 43, 100 through 104, 189). Contaminated soil locations are documented by surface (depth<2 feet) soil samples collected by LBG during September 2000, October 2001, and April, June, and November 2002 and by EPA in April 2005 (Ref. 3, pp. 7, 12 through 14, 25, 26, 62, 63; 7, pp. 26, 27, 40 through 43, 100 through 104, 189; 10, pp. 1, 4).

Containment

Release to ground water:

Not Scored

Release to surface water via overland migration:

Contaminants were detected in surface soils collected from the Source 3 area, providing evidence that there is not a maintained engineered cover (Ref. 3, pp. 12 through 14, 47 through 49; 7, pp. 100 through 104; 9, pp. 101, 103, 105, 127, 128, 139, 145, 1303, 1304, 1311, 1312, 1327, 1328, 1364, 1378, 1384, 1408, 1409, 1465, 1609, 1627, 1628; 25, Figures 2 and 3; 26, pp. 54, 57, 63; 27, pp. 40, 43, 45, 46; 28, pp. 1, 2). There is also no evidence of a maintained run-on control system and runoff management system at the site (Ref. 3, pp. 12 through 14; 7, pp. 205, 206). Therefore, the overland flow containment factor value for this source in the surface water migration pathway is 10 (Ref. 1, Table 4-2, p. 51609).

Containment (continued)

Release to surface water via flood:

LBG collected surface (depth<2 feet) and subsurface (depth>2 feet) soil samples during September 2000, October 2001, and April 2002, in the area of junkyard/metals recycling operations portion of the Matteo facility, as part of the NJDEP RI. Analytical results of surface soil samples GP-31A, GP-33A, GP-02A, GP-07A, GP-08A, GP-09A, GP-10A, GP-12A, GP-18A, GP-19A, GP-21A, GP-23A, and GP-25A indicated concentrations of lead ranging from 1,910 mg/kg to 7,860 mg/kg and concentrations of PCBs ranging from 1 mg/kg to 216 mg/kg; significantly above background concentrations (Ref. 7, pp. 100 through 104; 9, pp. 101, 103, 105, 127, 128, 139, 145, 1303, 1304, 1311, 1312, 1327, 1328, 1364, 1378, 1384, 1408, 1409, 1465, 1627, 1628).

In April 2005, EPA observed flooding at the Matteo site and collected surface (depth <2 feet) samples from source areas that were observed to be flooded (Ref. 3, pp. 12 through 14, 47 through 49; 25, Figure 3). Analytical results for surface soil samples MIM-SO-001, MIM-SO-002, MIM-SO-005, and MIM-SO-007 indicated concentrations of lead ranging from 15,100 mg/kg to 27,900 mg/kg and concentrations of PCBs ranging from 2.6 mg/kg to 200 mg/kg. Upon evaluation, some of these concentrations were significantly above background concentrations (Ref. 26, pp. 54, 57, 63; 27, pp. 40, 43, 45, 46). Based on these results, the April 2005 EPA sampling event confirmed the presence of lead and PCBs in Source 3 (Ref. 25, Figures 2 and 3; 28, pp. 1, 2).

Based upon the observation of flood waters of Hessian Run and Woodbury Creek in direct contact with the contaminated soil portion of the site; and lack of containment measures designed, constructed, operated, and maintained to prevent a washout of hazardous substances by flooding, a flood containment factor of 10 is assigned (Ref. 1, Table 4-2, p. 51609, Table 4-8, p. 51611; 3, pp. 12 through 14; 7, pp. 205, 206).

2.4.1 Hazardous Substances

LBG collected surface (depth<2 feet) and subsurface (depth>2 feet) soil samples during September 2000, October 2001, and April 2002, in the area of junkyard/metals recycling operations portion of the Matteo facility, as part of the NJDEP RI. The soil samples were analyzed for TAL Metals and TCL Pesticides/PCBs, and pH. Analytical results of surface soil samples GP-31A, GP-33A, GP-02A, GP-10A, GP-12A, GP-19A, GP-21A and GP-23A indicated the presence of lead and PCBs at concentrations significantly above concentrations detected in background samples (Ref. 7, pp. 100 through 104; 9, pp. 109, 127, 128, 148, 149, 1303, 1304, 1311, 1312, 1319,1327, 1328, 1347, 1368, 1378, 1398, 1408, 1409, 1431, 1465, 1477, 1627, 1628, 1641; 19, pp. 1, 4; 21, p. 1; 23, pp. 281, 287, 288, 291, 293, 295, 301, 311; 34, pp. 2, 3). Soil samples were collected from depths ranging from 0 to 1 foot bgs of mostly gravel sand and silt materials (Ref. 23, pp. 281, 287, 288, 291, 293, 295, 301, 311). Background surface soil samples GP-22A and TP-50A, consisting of mostly sand and silt, were collected immediately outside the influence of the facility operations, west of the former junkyard and current metals recycling facility, in the southern portion of the property (Ref. 7, pp. 102, 138, 189, 437; 9, pp. 311, 327, 1344, 1348; 23, pp. 72, 292).

In April 2005, WESTON observed flooding at NJDEP RI sample locations PB12S3 and S34N3, as well as other areas. WESTON subsequently screened several locations for PCBs and lead (Ref. 3, pp. 7, 12 through 14, 25, 26, 62, 63; 10, pp. 1, 4). The screening indicated the presence of PCBs in exceedence of 1 ppm (Ref. 10, pp. 1, 4). Confirmatory laboratory samples were collected at screening locations and analyzed for TAL Metals and TCL Pesticides/PCBs (Ref. 12, pp. 2, 5 through 8, 16, 23, 25; 25, Figure 2). The soil samples were all collected from depths ranging from 0 to 0.5 foot bgs, and consisted of gravel, sand, and silt (Ref. 3, pp. 29, 30, 37, 45 through 47). The samples were all analyzed as part of the same Sample Delivery Group (SDG), and the results were flagged as estimated, "J" (Ref. 26, pp. 4, through 44; 27, pp. 2 through 38; 28, pp. 1, 2). Analytical results of surface soil samples MIM-SO-001, MIM-SO-002, MM-SO-005, MIM-SO-007 indicated the presence of lead and PCBs; the concentrations of lead in MIM-SO-002 and MIM-SO-005, and PCBs in MIM-SO-002 were significantly above the concentrations detected in the background samples (Ref. 26, p. 54, 57, 63; 27, p.40, 43, 45, 46).

As shown below, the validated analytical results for shallow soil samples GP-31A, MIM-SO-002, and MIM-SO-005 indicate the presence of lead at concentrations significantly above background; shallow soil samples GP-02A, GP-23A, and MIM-SO-002 indicate the presence of PCBs at concentrations significantly above background (Ref. 7, p. 103; 9, pp. 127, 128, 145, 1303, 1304, 1311, 1312, 1327, 1328, 1408, 1409; 19, pp. 1, 4; 27, pp. 39, 45).

Hazardous Substance	Evidence	Reference(s)
Lead	Soil samples, LBG, Oct. 2001 and EPA, April 2005:	
(max: 27,900 J* mg/kg, (19,375))	GP-31A, MIM-SO-002, MIM-SO-005	7, pp. 103; 9, pp. 1465; 19, pp. 1, 4; 26, pp. 54, 57; 47, pp. 2, 5, 15
(max bg: 1,400 J* mg/kg (2,016))	MIM-SO-011	26, p. 63

* The values were flagged as estimated "J" because the relative percent difference between sample and duplicate results was greater than 35 % but less than 120 % for lead when both sample and duplicate results were greater than 5X CRQL (Ref. 26, p. 42). This indicates an unknown direction of bias. For the source sample , EPA has projected the actual value to be possibly as low as 19,375. For the background sample, the concentration could be possibly as high as 2,016. (See the EPA Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination* (i.e., the maximum release concentration of 27,900 mg/kg was divided by the adjustment factor of 1.44 and the maximum background concentration of 1,400 mg/kg was multiplied by the adjustment factor of 1.44) (Ref. 57, pp. 4, 5, 6, 8, 18). In this situation, the release sample concentration is significantly higher than in the background sample. While the method of considering possibly biased analyses was developed for use when establishing an observed release or observed contamination, because the procedures used in the analysis of the samples is the same for source samples as for release samples, EPA considers the possible variation in the sample concentration to be similar in either case.

PCBs **	Soil samples, LBG, Sept. 2000 and Oct. 2001 and EPA, April 2005	
(max: 216 J* mg/kg)	GP-02A, GP-23A, MIM-SO-002	7, pp. 100, 102; 9,pp. 127, 128, 1408, 1409; 19, pp. 1, 4; 27, pp. 40; 45, pp. 3, 4, 7; 46, pp. 2, 4, 15, 16
(max bg: 0.38 J* mg/kg (3.80))	MIM-SO-008	27, p. 46

*The maximum concentration was flagged as estimated "J" because the sample was analyzed 41 days after extraction and potential low bias is suggested (Ref. 46, pp. 15, 16). Because the concentration is significantly greater than the background level without accounting for the possible low bias, if the value is indeed lower than its true value, the possible low bias does not impact the decision that the PCBs are present in the source. See the EPA Fact Sheet (cited above) (Ref. 57, p. 8).

The maximum background value was flagged as estimated "J" because the soil samples were outside primary extraction holding time criteria, the surrogate percent recoveries exceeded the upper limit of the criteria window, and the percent difference between column results exceeded primary criteria (Ref 27, pp. 3, 6). This indicates an unknown bias; therefore, the actual concentration might be higher or lower than the reported value. EPA considers that the concentration is not likely to be above 3.80 mg/kg. Even if it were this high the source sample concentration is significantly above that concentration. See the EPA Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination* (i.e., the reported concentration of 0.38 mg/kg was multiplied by the adjustment factor of 10) (Ref. 57, pp. 4, 5, 6, 8, 16).

**The PCB concentration presented in this documentation record represent the sum of all PCB Aroclor mixes that were analyzed for and calculated to be above the appropriate detection limit. The number of Aroclors analyzed for varied by study, but comparisons between background and release or source samples were only made among samples from the same study.

In addition to the samples listed above, LBG collected surface (depth<2 feet) soil samples GP-10A, GP-12A, GP-19A, GP-21A, and GP-33A in September 2000, October 2001, and April 2002 (Ref. 7, pp. 100 through 103; 9, pp. 145, 1303, 1304, 1311, 1312, 1327, 1328, 1627, 1628). PCBs were detected in those four samples at concentrations ranging from 2.03 mg/kg to 9.76 mg/kg; lead was detected in samples GP-10A and GP-33A at 3,080 mg/kg and 2,490 mg/kg, respectively (Ref. 7, pp. 100 through 103; 9, pp. 145, 1303, 1304, 1311, 1312, 1327, 1328, 1627, 1628; 21, p. 1). Maximum background concentrations collected during the NJDEP RI for background samples TP-50, which showed the maximum background concentration for lead at 104 mg/kg and GP-22A which showed the maximum background concentration for PCBs at 0.40 mg/kg (Ref. 7, pp. 102, 139; 9, pp. 311, 1344; 19, p. 4; 21, p. 1; 43, p. 3).

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored (NS).

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to evaluate Tier B source hazardous waste quantity; therefore, hazardous wastestream quantity is not scored.

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Volume

The information available is not sufficient to evaluate Tier C source hazardous waste quantity; therefore, volume (V) is assigned a value of 0 (Ref. 1, p. 51591, Section 2.4.2.1.3).

Volume (V) Value: 0

2.4.2.1.4 Area

Source 3 consists of contaminated soil. The contaminated soil is defined by contaminated surface (depth<2 feet) samples collected by LBG in September 2000, October 2001, and April, June, and September 2002 and by contaminated surface (depth <2 feet) samples collected by EPA in April 2005 (Ref. 3, pp. 7, 12 through 14, 25, 26, 62, 63; 7, pp. 26, 27, 40 through 43, 100 through 104, 189; 10, pp. 1, 4). The contaminated soil is located throughout the Matteo property but is not known to be continuous (Ref. 7, pp. 26, 27, 40 through 43, 100 through 104, 189). Therefore, the value of "greater than 0 but unknown" is assigned. The source type is contaminated soil, so the area value is divided by 34,000 to obtain the assigned value, as shown below (Ref. 1, p. 51591, Section 2.4.2.1.4, Table 2-5).

Area of source (ft^2): >0

Area (A) Assigned Value: (>0)/(34,000) = >0

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is 4.23 for Tier D - Area (Ref. 1, p. 51591, Section 2.4.2.1.5).

Source Hazardous Waste Quantity Value: >0

SITE SUMMARY OF SOURCE DESCRIPTIONS

Source Number	Source Hazardous Waste Quantity Value	Containment: Ground Water	Containment: Surface Water	Containment: Air Gas	Containment: Air Particulate
1	17,240.00	NS	10*	NS	NS
2	76.30	NS	10*	NS	NS
3	>0	NS	10*	NS	NS

NS = Not Scored

* Overland flow containment and flood containment factors are 10 for all three sources.

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Component

The Matteo facility is located within the Lower Delaware River watershed, at the confluence and within the 100-year floodplain of Woodbury Creek and its tributary, Hessian Run (Ref, 4, pp. 1 through 3; 7, p. 19; 25, Figures 3 and 5; 32, p. 3). Both streams are tidally influenced at this location, with tidal fluctuations ranging from approximately 5.4 feet at neap tide to approximately 6 feet at spring tides (Ref. 7, p. 19). Average salinity measurements for Woodbury Creek and Hessian Run collected by NJDEP during high and low tides were negligible, indicating a fresh water environment (Ref. 7, pp. 19, 83, 84, 170; 23, pp. 151, 152, 226 through 237; 36, p. 61).

There are two areas where contamination could be entering surface water from the site sources (probable points of entry (PPEs)) for the Matteo site. The PPE (PPE1) for Source 1 is the entire interface between the battery piles and Hessian Run. The most upstream point of PPE1 is represented by a point located along Hessian Run in the northeastern portion of the property. PPE1 is the furthest upstream location where the battery casing waste pile (Source 1) was observed to be in direct contact with Hessian Run; it is also the PPE via overland flow for contaminated soil (Source 3) located in the eastern portion of the property (Ref. 3, pp. 5, 6, 7, 12, 20, 53, 59 through 61; Ref. 25, Figures 3, 5). PPE2 is located along Woodbury Creek in the western portion of the property, where flood waters drain through tributaries of Woodbury Creek (Ref. 25, Figures 3 and 5). WESTON observed flooding in portions of Source 2 (inactive landfill) and Source 3 (contaminated soil) on April 4 and 5, 2005 (Ref. 3, pp. 3 through 14, 19, 20, 61 through 69; 25, Figure 3). The 15-mile surface water pathway is measured from PPE2, the farthest downstream PPE (Ref. 25, Figure 5). Woodbury Creek flows from PPE2 for approximately 1.3 miles, where it enters the Delaware River. The target distance limit (TDL) is located in the Delaware River 13.7 miles downstream of Woodbury Creek (Ref. 25, Figure 5). Hessian Run is defined as a minimal stream with a streamflow of less than 10 cubic feet per second (ft^3/sec) and Woodbury Creek is characterized as a Small to Moderate Stream with an estimated streamflow of 15 ft^3/sec (Ref. 1, p. 51613, Table 4-13; 32, p. 1). The Lower Delaware River is defined as a large river with an annual mean streamflow of 11,701 ft^3/sec (Ref. 1, p. 51613, Table 4-13; 31, p. 1). The rest of Source 3 drains to PPE2.

Recent observations made at the facility indicate that the northern boundary of the property is comprised of piles of crushed battery casings (Source 1), visible at ground surface, which are in direct contact with Hessian Run (Ref. 3, pp. 5, 6, 7, 12, 20, 53, 59 through 61; 25, Figure 3). Based on the evidence that the northern boundary of the property is comprised of battery casing piles which are in contact with Hessian Run, the distance from Source 1 to PPE1 can be considered to be 0 feet. The distance from the eastern portion of source 3 to PPE1via an overland flow segment is approximately 300 feet (Ref. 25, Figure 3; 30, p. 3). The westernmost sample in Source 3 is approximately 1600 feet from PPE2.

Information obtained from USGS indicates that precipitation and streamflow levels upstream of the Matteo property were significantly higher than normal in early April 2005 (Ref. 13, pp. 1, 5, 8, 20, 21). Data obtained from USGS Gauging Station No. 01464598 located in the Delaware River upstream of the facility in Burlington, New Jersey, indicates that the mean gauge heights on April 3 and 4, 2005, were significantly higher than the mean gauge heights recorded before and after the early April rain event (Ref. 13, pp. 1, 20, 21). The entire northeastern portion of the Matteo property, including both the landfill portion of the property (Source 2) as well as the contaminated soil portion of the property (Source 3), were observed to be flooded by Woodbury Creek and Hessian Run during a site walk completed after the major rain event (Ref. 3, pp. 7, 25, 62, 63; 7, pp. 205, 206). Based on the evidence that the landfill and contaminated soil portions of the property were observed to be in contact with flood waters from Hessian Run and Woodbury Creek, the distance from Source 2 and Source 3 to Woodbury Creek at PPE2 and to Hessian Run at and downstream of PPE1 can be considered to be 0 feet (Ref. 3, pp. 7, 8, 25, 62, 63; 7, pp. 205, 206; 13, pp. 1, 20, 21). The battery pile was also in direct contact with flood waters (Ref. 25, Figure 3.)

As part of the NJDEP RI completed by LBG, surficial soil samples were collected throughout the property in September and October 2000 and in February 2001 to characterize PCB concentrations (Ref. 7, pp. 23, 39, 40, 95 through 99). Three of these samples (PB12W6A, PB12S3A, S34N3B) can be used to characterize surficial contamination of PCBs in the landfill area of the property (Ref. 7, pp. 97, 98; 9, pp. 420 through 423, 502, 503). Due to the fact that this area was observed to be flooded on April 4 and 5, 2005, two of these sample locations (PB12S3 and S34N3) were revisited by WESTON and screened for PCBs and lead (Ref. 3, pp. 7, 12 through 14, 25, 62, 63; 10, pp. 1, 4). In both cases, the PCB concentrations were detected in exceedence of 1 ppm (Ref. 10, pp. 1, 4).

EPA collected source samples MIM-SO-002 and MIM-SO-007 [EPA Sample No. B1ZT1 and B1ZT6] to confirm the presence of PCBs in source areas subject to flooding (Ref. 3, pp. 29, 30, 47; 12, pp. 2, 5, 6, 16, 23, 25; 25, Figure 2). PCBs were detected in MIM-SO-002 and MIM-SO-007 at estimated concentrations of 200,000 ug/kg and 12,000 ug/kg, respectively (Ref. 27, p. 45; 28, p. 1) The maximum reported background PCB concentration during the sampling event was estimated at 380 ug/kg in sample MIM-SO-008 [EPA Sample No. B1ZT7] (Ref. 27, p. 46; 28, p. 1).

4.1.2.1 Likelihood of Release

4.1.2.1.1 Observed Release

The source areas on the Matteo property were observed to be flooded on April 4 and 5, 2005. Sample location PB12S3 was contained within an area observed to be flooded (Ref. 3, pp. 5, 6, 7, 12, 13, 30, 47; 25, Figure 3). EPA collected source sample MIM-SO-007 to confirm the presence of PCBs at sample location PB12S3 previously subject to flooding (Ref. 3, pp. 30, 47; 12, pp. 2, 6, 16, 23, 25; 25, Figure 2). PCBs were detected at an estimated concentration of 12,000 ug/kg (Ref. 27, p. 45; 28, p. 1). This result confirms the presence of PCBs in that portion of the source that is subject to flooding (Ref. 3, pp. 7, 12, 13, 25, 62, 63; 10, pp. 1, 4; 25, Figure 3; 27, p. 45).

Sediment samples collected by LBG in October and November 2000 indicate an observed release by chemical analysis to the surface water pathway (Ref. 7, pp. 34 through 36, 50, 51, 153 through 158, 159 through 163,199, 203). Sediment samples collected from transects bisecting Hessian Run and Woodbury Creek indicated the highest concentrations (greater than three times the background concentrations) of lead and PCBs adjacent to the northern boundary of the Matteo property in Hessian Run and immediately downstream of PPE 2 in Woodbury Creek (Ref. 7, pp. 35, 199, 202). PCBs were manufactured prior to 1977 and are released to the environment through improper disposal of industrial wastes and consumer products (Ref. 17, p. 1 through 5).

Direct Observation by Flooding

An observed release by Direct Observation by Flooding of the site sources is identified based on the observation by EPA contractors on April 4, 2005. As documented below, surface contamination and waste were in direct contact with the flood waters, demonstrated by sampling prior and after the flood event.

As part of the NJDEP RI, LBG collected surficial soil samples throughout the Matteo property in September and October 2000 and in February 2001 to characterize PCB concentrations (Ref. 7, pp. 23, 39, 40, 95 through 99). Three of these samples (PB12W6A, PB12S3A, S34N3B) can be used to characterize surficial contamination of PCBs in the landfill area of the property (Ref. 7, pp. 97, 98; 9, pp. 420 through 423, 502, 503). Due to the fact that this area was observed to be flooded on April 4 and 5, 2005, two of these sample locations (PB12S3 and S34N3) were revisited by WESTON on April 27, 2005 and screened for PCBs and lead (Ref. 3, pp. 7, 25, 62, 63; 10, pp. 1, 4). In both cases, the PCBs concentrations were detected in exceedence of 1ppm (Ref. 10, pp. 1, 4).

EPA collected source samples MIM-SO-002 and MIM-SO-007 [EPA Sample No. B1ZT1 and B1ZT6] to confirm the presence of PCBs in source areas subject to flooding (Ref. 3, pp. 29, 30, 47; 12, pp. 2, 5, 6, 16, 23, 25; 25, Figure 2). PCBs were detected in MIM-SO-002 and MIM-SO-007 at estimated concentrations of 200,000 J ug/kg and 12,000 J ug/kg, respectively (Ref. 27, p. 45; 28, p. 1) The maximum reported background PCB concentration during the sampling event was estimated at 380 J ug/kg in sample MIM-SO-008 [EPA Sample No. B1ZT7] (Ref. 27, p. 46; 28, p. 1).

The maximum background value was flagged as estimated "J" because the soil samples were outside primary extraction holding time criteria, the surrogate percent recoveries exceeded the upper limit of the criteria window, and the percent difference between column results exceeded primary criteria (Ref. 27, pp. 3, 6). This indicates an unknown bias, therefore the actual true value may be higher or lower that the reported value. However, EPA projects the highest possible value might be 3,800 ug/kg. If the background level were actually this high, the sources sample concentrations remain significantly higher and support the presence of the PCBs associated with the site in contact with the flood waters. See the EPA Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination* (i.e., the reported concentration of 380 ug/kg was multiplied by the adjustment factor of 10) (Ref. 57, pp. 4, 5, 6, 8, 16).

The maximum concentration in a source sample was flagged as estimated "J" because the sample was analyzed 41 days after extraction. This suggests potential low bias (Ref. 46, pp. 15, 16). However, because the reported concentration is significantly above background without considering the possibility that the source concentration may actually be higher, this possible low bias does not alter the identification of the substance as elevated in the source. (See the EPA Fact Sheet cited above) (Ref. 57, p. 8). EPA Sample No. B1ZT1 (MIMS0-002) confirms the presence of PCBs at concentrations greater than three times background, in that portion of the source that is subject to flooding (Ref. 3, pp. 7, 25, 62, 63; 10, pp. 1, 4; 27, p. 45).

Note that the PCB concentration presented in this documentation record represent the sum of all PCB Aroclor mixes that were analyzed for and calculated to be above the appropriate detection limit. The number of Aroclors analyzed for varied by study, but comparisons between background and release or source samples were only made among samples from the same study.

Chemical Analysis

Sediment samples collected by LBG in October and November 2000 indicate an observed release by chemical analysis to the surface water pathway (Ref. 7, pp. 34 through 36, 50, 51, 153 through 158, 159 through 163,199, 203). Sediment samples collected from transects bisecting Hessian Run and Woodbury Creek indicated the highest concentrations (greater than three times the background concentrations) of lead and PCBs adjacent to the northern boundary of the Matteo property in Hessian Run and immediately downstream of PPE 2 in Woodbury Creek (Ref. 7, pp. 35, 199, 202). Contaminated sediment samples were collected from transects 9, 11, and 15 along the northern portion of the facility from sediment within the floodplain of Hessian Run (Ref. 4, pp. 1 through 3; 7, pp. 199, 202; 9, pp. 444, 456, 601, 646, 647, 657, 658, 661 through 663, 972, 974, 976, 1003 through 1008; 23, pp. 119, 135, 226; 25, Figure 3). The release sediment sample from transect 22 was collected from Woodbury Creek adjacent to the western boundary of the facility, immediately downstream of PPE2 (Ref 7, pp. 199, 202; 9, pp. 1058, 1059; 23, p. 152; 25, Figure 3). Among other parameters, each sample was analyzed for lead, PCBs, Total Organic Carbon (TOC), pH, and grain size (Ref. 7, p. 35; 9, pp. 456, 622, 633, 812, 933, 1008, 1213; 19, pp. 1, 2, 5). Background sediment samples from transects 1 and 2 were collected along Hessian Run upstream of the facility (Ref. 7, pp. 153, 159, 199, 202; 9, pp. 750, 800, 812, 1148, 1150, 1152, 1198 through 1200, 1213; 19, pp. 1, 2; 23, pp. 223, 224). Background sediment samples from transect 25 were collected along Woodbury Creek upstream of the Matteo facility (Ref. 7, pp. 157, 162, 199, 202; 9, pp. 909, 910, 916, 933; 23, pp. 150, 151; 25, Figure 3).

Sample Similarity:
The sediment samples listed below were collected by LBG during the NJDEP RI. The background and release sediment samples listed all consisted of mostly fine-grained materials (i.e., silt and clay) and organic matter (Ref. 23, pp. 119, 135, 152, 223, 226, 234, 236). Four of the background samples and four of the release samples were analyzed for total organic carbon (TOC); TOC concentrations in the background samples ranged from 89,800 mg/kg to 124,000 mg/kg, while TOC concentration in the release samples ranged from 63,200 mg/kg to104,000 mg/kg (Ref. 9, pp. 602, 757, 973, 975, 977, 1149, 1151, 1153). Percent moisture for the background samples ranged from 18.3% to 76.7% and the release sample values ranged from 48.6% to 65.5% (Ref. 9, pp. 444, 601, 647, 650, 657, 658, 661, 750, 756, 909, 972, 974, 976, 1148, 1150, 1152, 1651, 1723, 1726). Due to the similarities between background and release samples (i.e., overlapping ranges of sediment description, TOC, and percent moisture values), the analytical results are considered to be comparable for the purpose of this HRS Documentation Record.

Although site-related contaminants were detected in upstream samples, possibly due to the effects of tidal carry, the upstream concentrations demonstrate background conditions when compared to the release samples collected adjacent to site sources and PPEs (Ref. 7, pp. 19, 202; 25, Figure 3). During the NJDEP RI, sediment samples were collected throughout Hessian Run and Woodbury Creek: adjacent to the site, upstream, and downstream (Ref. 7, pp. 153 through 163, 201; 25, Figure 3). Samples collected from downstream as well as upstream locations show lead and PCB concentrations that are significantly lower than concentrations in samples collected from locations adjacent to site sources

or immediately downstream of site PPEs (Ref. 7, pp. 153 through 163, 201; 25, Figure 3). These results demonstrate that flow reversal due to tidal influence is not the cause of the significant increase in contaminant levels adjacent to the sources and PPEs (Ref. 7, pp. 153 through 163, 201; 25, Figure 3). Only the upstream sample locations are used to demonstrate background conditions for HRS scoring purposes.

Note:
NJDEP performed data validation of the analytical results for the sediment sampling event conducted in October and November 2000 (Ref. 48, p. 3; 49, p. 3; 50, p. 3; 51, p. 2; 52, p. 3; 53, p. 3; 56, p. 3). However, most of the lead results were not validated as part of the data validation exercise (Ref. 48, p. 3; 49, p. 3; 50, p. 3; 51, p. 2; 52, p. 3; 53, p. 3; 56, p. 3). The results that were validated did not include data qualifiers and did not demonstrate maximum background concentrations (i.e., 411 mg/kg) (Ref. 7, p. 153; 9, p. 1150; 48, p. 3; 49, p. 3; 50, p. 3; 51, p. 2; 52, p. 3; 53, p. 3; 56, p. 3). Therefore, for the purposes of this HRS scoring, the maximum background concentration for lead is used to demonstrate background conditions.

Note also that the PCB concentration presented in this documentation record represent the sum of all PCB Aroclor mixes that were analyzed for and calculated to be above the appropriate detection limit. The number of Aroclors analyzed for varied by study, but comparisons between background and release or source samples were only made among samples from the same study.

Background Concentrations

Sample ID	Sampling Location	Depth	Date	Reference(s)
T2-BA	Hessian Run, upstream of Matteo facility	0 to 6 inches	10/31/00	7, pp. 153, 159, 199, 202; 9, pp. 1721 through 1723, 1727; 23, p. 223
T2-BB	Hessian Run, upstream of Matteo facility	1 to 2 feet	10/31/00	7, pp. 153, 159, 200, 203; 9, pp. 1724 through 1727; 23, p. 223
T2-BC	Hessian Run, upstream of Matteo facility	2 to 3 feet	10/31/00	7, pp. 153, 159, 201, 204; 9, p. 812; 23, p. 223
T2-AC	Hessian Run, upstream of Matteo facility	2 to 3 feet	10/31/00	7, pp. 153, 159, 201, 204; 9, p. 812; 23, p. 223
T1-BA	Hessian Run, upstream of Matteo facility	0 to 6 inches	11/16/00	7, pp. 153, 159, 199, 202; 9, p. 1213; 23, p. 234
T1-BB	Hessian Run, upstream of Matteo facility	1 to 2 feet	11/16/00	7, pp. 153, 159, 200, 203; 9, p. 1213; 23, p. 234
T1-BC	Hessian Run, upstream of Matteo facility	2 to 3 feet	11/16/00	7, pp. 153, 159, 201, 204; 9, p. 1213; 23, p. 234
T23-AB	Woodbury Creek, upstream of Matteo facility	1 to 2 feet	11/17/00	7, pp. 161, 203; 9, p. 1660; 23, p. 236
T25-EB	Woodbury Creek, upstream of Matteo facility	1 to 2 feet	11/09/00	7, pp. 162, 203; 9, p. 933; 23, p. 150

Sample ID	Hazardous Substance	Conc (mg/kg)	SQL (mg/kg) *	Reference(s)
T2-BA	Lead / PCBs	183 / 0.140 U	1 / 0.140	7, pp. 153, 159; 9, pp. 1721 through 1723, 1727; 18, p. 1; 19, p. 2; 50, pp. 3, 4, 9
T2-BB	Lead / PCBs	258 / **0.180**	1 / 0.080	7, pp. 153, 159; 9, pp. 1724 through 1727; 18, pp. 1, 2; 19, pp. 2, 6; 50, pp. 3, 4, 9
T2-BC	Lead / PCBs	40.9 / 0.090 U	1 / 0.090	7, pp. 153, 159; 9, pp. 750, 800; 18, p. 1; 19, p. 1; 49, pp. 2, 3, 9
T2-AC	Lead / PCBs	246 / 0.140 U	1 / 0.140	7, pp. 153, 159; 9, pp. 756, 803; 18, p. 1; 19, p. 1; 49, pp. 2, 3, 9
T1-BA	Lead / PCBs	384 / 0.093 U	1 / 0.093	7, pp. 153, 159; 9, pp. 1148, 1198; 18, p. 1; 19, p. 2; 48, pp. 3, 4, 9
T1-BB	Lead / PCBs	**411** / 0.092 U	1 / 0.092	7, pp. 153, 159; 9, pp. 1150, 1199; 18, p. 1; 19, p. 2; 48, pp. 3, 4, 9
T1-BC	Lead / PCBs	57.0 / 0.088 U	1 / 0.088	7, pp. 153, 159; 9, pp. 1152, 1200; 18, p. 1; 19, p. 2; 48, pp. 3, 4, 9
T23-AB	PCBs	0.040 U	0.040	7, p. 161; 9, p. 1651; 19, p. 5; 55, pp.1, 39
T25-EB	PCBs	**0.046** U	0.046	7, p. 162; 9, p. 909; 19, p. 6; 56, pp. 3, 4, 9

The bolded values represent the background levels for PCBs and Lead. The lead background for all Hessian Run samples is 411 mg/kg. The background for PCBs is 0.046 mg/kg for Woodbury Creek samples , and 0.180 mg/kg for Hessian Run samples.

* If the SQL was unavailable, the Contract-Required Quantitation Limit (CRQL) is listed. The CRQLs were obtained from the EPA CLP website (Reference 18). While the analyses were not performed under the CLP, the analytical procedures used were equivalent. Therefore the detection limits are the same as for CLP analyses.

Contaminated Samples

Sample ID	Sampling Location	Depth	Date	Reference(s)
T9-EA	Hessian Run, adjacent to Matteo facility	0 to 6 inches	11/10/00	7, pp. 154, 160, 199, 202; 9, p. 1008; 23, p. 226
T9-EB	Hessian Run, adjacent to Matteo facility	1 to 2 feet	11/10/00	7, pp. 154, 160, 200, 203; 9, p. 1008; 23, p. 226
T9-EC	Hessian Run, adjacent to Matteo facility	2 to 3 feet	11/10/00	7, pp. 154, 160, 201, 204; 9, p. 1008; 23, p. 226
T11-AB	Hessian Run, adjacent to Matteo facility	1 to 2 feet	10/27/00	7, pp. 160, 203; 9, p. 663; 23, p. 135
T11-AC	Hessian Run, adjacent to Matteo facility	2 to 3 feet	10/27/00	7, pp. 160, 204; 9, p. 663; 23, p. 135
T11-BC	Hessian Run, adjacent to Matteo facility	2 to 3 feet	10/27/00	7, pp. 160, 204; 9, p. 663; 23, p. 135
T11-DB	Hessian Run, adjacent to Matteo facility	1 to 2 feet	10/27/00	7, pp. 160, 203; 9, p. 662; 23, p. 135
T11-EA	Hessian Run, adjacent to Matteo facility	0 to 6 inches	10/27/00	7, pp. 154, 160, 199, 202; 9, p. 662; 23, p. 135
T11-EB	Hessian Run, adjacent to Matteo facility	1 to 2 feet	10/27/00	7, pp. 160, 203; 9, p. 662; 23, p. 135
T15-EA	Hessian Run, adjacent to Matteo facility	0 to 6 inches	10/17/00	7, pp. 160, 202; 9, p. 456; 23, p. 119
T22-AB	Woodbury Creek adjacent to the Matteo Facility	1 to 2 feet	11/09/00	7, pp. 161, 203; 9, p. 1059; 23, p. 152

Sample ID	Hazardous Substance	Conc (mg/kg)	SQL (mg/kg) *	Reference(s)
T9-EA	Lead / PCBs	15,300 / 8.3	1 / 0.240	7, pp. 154, 160; 9, pp. 972, 1004; 18, p. 1; 19, p. 6; 51, pp. 2, 3, 8, 9
T9-EB	Lead / PCBs	25,200 / 3.0	1 / 0.089	7, pp. 154, 160; 9, pp. 974, 1005; 18, p. 1; 19, p. 6; 51, pp. 2, 3, 8
T9-EC	Lead / PCBs	19,500 / 0.570	1 / 0.062	7, pp. 154, 160; 9, pp. 976, 1006; 18, p. 1; 19, p. 6; 51, pp. 2, 3, 8
T11-AB	PCBs	1.070	0.370	7, p. 160; 9, p. 657; 19, p. 2; 52, pp. 3, 4, 9
T11-AC	PCBs	1.190	0.410	7, p. 160; 9, p. 658; 19, p. 2; 52, pp. 3, 4, 9

T11-BC	PCBs	0.560	0.430	7, p. 160; 9, p. 661; 19, p. 2; 52, pp. 3, 4, 9
T11-DB	PCBs	0.640	0.480	7, p. 160; 9, p. 650; 19, p. 2; 52, pp. 3, 4, 9
T11-EA	Lead / PCBs	2,490 / 4.8	1 / 0.580	7, pp. 154, 160; 9, pp. 601, 646; 18, p. 1; 19, p. 2; 52, pp. 3, 4, 9, 10
T11-EB	PCBs	1.370	0.400	7, p. 160; 9, p. 647; 19, p. 2; 52, pp. 3, 4, 9
T15-EA	PCBs	1.220	0.069	7, p. 160; 9, p. 444; 19, p. 2; 53, pp. 3, 5, 10
T22-AB	PCBs	4.4	0.410	7, p. 161; 9, p. 1058; 35, all pages; 54, pp. 1, 7

Attribution (chemical analysis):

According to available records, the Matteo family has operated an unregistered landfill, junkyard, and metals recycling facility at the property since 1961 (Ref. 7, p. 12; 22, pp. 9, 10, 87, 88, 99). Sediment samples collected by LBG in October and November 2000 document an observed release by chemical analysis to the surface water pathway (Ref. 7, pp. 34 through 36, 50, 51, 153 through 158, 159 through 163,199, 203). Sediment samples collected from transects bisecting Hessian Run and Woodbury Creek indicated the highest concentrations (greater than threetimes the background concentrations) of lead and PCBs were detected adjacent to the northern boundary of the Matteo property in Hessian Run and immediately downstream of PPE 2 in Woodbury Creek (Ref. 7, pp. 35, 199, 202).

Contaminated sediment samples were collected from transects 9, 11, and 15 along the northern portion of the facility from sediment within the floodplain of Hessian Run (Ref. 4, pp. 1 through 3; 7, pp. 199, 202; 9, pp. 444, 456, 601, 646, 647, 657, 658, 661 through 663, 972, 974, 976, 1003 through 1008; 23, pp. 119, 135, 226; 25, Figure 3). The release sediment sample from transect 22 was collected from Woodbury Creek adjacent to the western boundary of the facility, immediately downstream of PPE2 (Ref. 7, pp. 199, 202; 9, pp. 1058, 1059; 23, p. 152; 25, Figure 3). Background sediment samples from transects 1 and 2 were collected along Hessian Run upstream of the facility (Ref. 7, pp. 153, 159, 199, 202; 9, pp. 750, 800, 812, 1148, 1150, 1152, 1198 through 1200, 1213; 19, pp. 1, 2; 23, pp. 223, 224). Background sediment samples from transect 25 were collected along Woodbury Creek upstream of the Matteo facility (Ref. 7, pp. 157, 162, 199, 202; 9, pp. 909, 910, 916, 933; 23, pp. 150, 151; 25, Figure 3).

A search of available environmental records was conducted for facilities within a 1-mile radius of the Matteo facility. This records search was conducted according to the requirements of the American Society of Testing and Materials (ASTM) for environmental site assessments (Ref. 33, pp. 15 through 230). Records searched include the NPL database, the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), the Resource Conservation and Recovery Information System (RCRIS), known contaminated sites in New Jersey, and the New Jersey Spills lists. A review of these records indicates the presence of numerous sites within a 1-mile radius of the Mateo and Sons, Inc. facility, including two leaking underground storage tank (LUST) sites and five New Jersey Spills sites within a 0.25-mile radius of the Matteo facility (Ref. 33, pp. 15 through 230). In addition, an automobile repair facility and truck stop are adjacent to the Matteo facility (Ref. 3, p. 10). Despite the presence of possible alternate sources of lead contamination (i.e., LUST sites, NJ Spills sites, truck stop and automobile repair facility), the NJDEP RI sediment results indicate that the Matteo site is a source of the observed release. The NJDEP RI sediment samples were collected throughout Hessian Run and Woodbury Creek: adjacent to the site, upstream, and downstream (Ref. 7, pp. 153 through 163, 201; 25, Figure 3). Samples collected from downstream as well as upstream locations show lead and PCB concentrations that are significantly lower than concentrations in samples collected from locations adjacent to site sources or immediately downstream of site PPEs (Ref. 7, pp. 153 through 163, 201; 25, Figure 3). These results demonstrate

that the Matteo site is at least partially attributable for the significant increase in contaminant levels adjacent to the sources and PPEs (Ref. 7, pp. 153 through 163, 201; 25, Figure 3).

A large refinery is also located north of the site. However, surface water runoff from this refinery drains to the Delaware River and thus unlikely to be a source of contamination to Hessian Run.

Regardless of the presence of other possible off site sources, the establishment of a direct observation based on the visual and documented evidence of flood waters in contact with site sources clearly establishes that a portion of the contamination establishing the significant increase in contaminant levels is attributable to the site.

Hazardous Substances Released (direct observation):
Lead
PCBs

Hazardous Substances Released (chemical analysis):
Lead
PCBs

Observed Release Factor Value: 550

4.1.3.2 Human Food Chain Threat - Waste Characteristics

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

Hazardous Substance*	Source Numbers	Toxicity Factor Value	River Persistence Factor Value	Fresh Water Food Chain Bioaccumulation Factor Value**	Toxicity/ Persistence/ Bioaccumulation Factor Value (Table 4-16)	Reference
Lead	1, 2, 3, OR	10,000	1	5	5.0×10^4	2, p. BI-8
PCBs	1, 2, 3, OR	10,000	1	50,000	5.0×10^8	2, p. BI-10

* Lead and PCBs are both documented in the observed releases by direct observation and chemical analysis.

** Average salinity measurements for Woodbury Creek and Hessian Run collected by NJDEP during high and low tides were negligible (0.01), indicating a fresh water environment (Ref. 7, pp. 19, 83, 84, 170; 23, pp. 151, 152, 226 through 237; 36, p. 61). The food chain bioaccumulation factor value that corresponds to the type of water body (i.e., fresh water) in which the Woodbury Creek fishery is located is used to assign the bioaccumulation potential factor value to the hazardous substances (Ref. 1, p. 51617).

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Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.3.2.2 Hazardous Waste Quantity

Source Number	Source Hazardous Waste Quantity (HWQ) Value (Section 2.4.2.1.5.)	Is source hazardous constituent quantity data complete? (yes/no)
1	17,240.00	no
2	76.30	no
3	>0	no

Sum of Values: 17,316
(rounded to nearest integer as specified in HRS Section 2.4.2.2)

The sum of values for source hazardous waste quantity factor values as determined in Section 2.4.2.2 of the documentation record corresponds to a value of 10,000 in Table 2-6 of the HRS. Therefore, the hazardous waste quantity factor value for the surface water pathway is 10,000 (Ref. 1, p. 51591).

4.1.3.2.3 Waste Characteristics Factor Category Value

One hazardous substance (PCBs) associated with waste sources that have a surface water pathway containment factor greater than 0 for the Lower Delaware River watershed corresponds to the maximum toxicity/persistence factor value (10,000) and bioaccumulation factor value (50,000), as shown previously (Ref. 1, pp. 51613, 51617).

(Toxicity/persistence factor value) x (hazardous waste quantity factor value) = 10,000 x 10,000 = 1×10^8

(Toxicity/persistence factor value x hazardous waste quantity factor value)
x (bioaccumulation potential factor value) = $(1 \times 10^8) \times (50,000) = 5 \times 10^{12}$

The product corresponds to the maximum Waste Characteristics Factor Category Value of 1,000 in Table 2-7 of the HRS (Ref. 1, pp. 51592).

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Hazardous Waste Quantity Assigned Value: 10,000
Waste Characteristics Factor Category Value: 1,000

4.1.3.3 Human Food Chain Threat-Targets

EPA verified that Woodbury Creek is a fishery, however, fishing in the zone of contamination is not specifically documented (Ref. 14, pp. 1 through 3; 16, p. 1). Therefore, the target fishery is evaluated for potential contamination (Ref. 1, pp. 51592, 51620, 51621).

Closed Fisheries

None

Benthic Tissue

None

Level I Concentrations

None

Level II Concentrations

None

Level II Fisheries

None.

4.1.3.3.1 Food Chain Individual

Sample ID: T22-AB
Hazardous Substance: PCBs
Bioaccumulation Potential: 50,000

(Ref. 2, p. BI-10)

Identity of Fishery	Type of Surface Water Body	Dilution Weight	Reference(s)
Woodbury Creek	Small to moderate stream (>10 to 100 cfs net annual flow rate)	0.1	1, p. 51613; Ref. 32, p. 1

There is an observed release of PCBs, which has a bioaccumulation factor of 500 or greater, to the watershed and there is a fishery (i.e., Woodbury Creek) present within the target distance limit (Ref. 1, p. 51620; 2, p. BI-10; 14, pp. 1 through 3; 16, p. 1) . Therefore, the food chain individual factor is assigned the value of 20 (Ref. 1, p. 51592, 51620).

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Food Chain Individual Factor Value: 20

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

The Level I Concentrations Factor Value is 0 because there are no fisheries subject to Level I concentrations (Ref. 1, pp. 51620, 51621).

==========

Level I Concentrations Factor Value: 0

4.1.3.3.2.2 Level II Concentrations

The Level II Concentrations Factor Value is 0 because there are no fisheries subject to Level II concentrations (Ref. 1, p. 51621).

==========

Level II Concentrations Factor Value: 0

4.1.3.3.2.3 Potential Human Food Chain Contamination

EPA documented the fish consumption rate for the Woodbury Creek fishery to be in the category "Greater than 100 to 1,000 pounds per year" (Ref. 1, p. 51621; 14, pp. 1 through 3; 16, p. 1), which corresponds to the assigned human food chain population value of 0.3 in Table 4-18 of the HRS (Ref. 1, p. 51621).

Identity of Fishery	Annual Production (pounds)	Type of Surface Water Body	Average Annual Flow (net) (cfs)	Population Value (P_i)	Dilution Weight (D_i)	$P_i x D_i$
Woodbury Creek	100-1,000	Small to Mod. Stream (fresh water)	15	0.3	0.1	0.03

Sum of $P_i \times D_i$: 0.03
(Sum of $P_i \times D_i$)/10: 0.003

Ref. 1, pp. 51613, 51621; 7, pp. 19, 170; 14, p. 1; 32, p. 1; 23, pp. 151, 152, 226 through 237; 36, p. 61

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Potential Human Food Chain Contamination Factor Value: 0.003

4.1.4.2 Environmental Threat - Waste Characteristics

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Hazardous Substance*	Source Numbers	Fresh Water Ecotoxicity Factor Value	River Persistence Factor Value	Fresh Water Bioaccumulation Factor Value**	Ecotoxicity/ Persistence/ Bioaccumulation Factor Value (Table 4-21)	Reference
Lead	1, 2, 3, OR	1,000	1	50,000	5.0×10^7	2, p. BI-8
PCBs	1, 2, 3, OR	10,000	1	50,000	5.0×10^8	2, p. BI-10

* Lead and PCBs are both documented in the observed releases by direct observation and chemical analysis.

** Average salinity measurements for Woodbury Creek and Hessian Run collected by NJDEP during high and low tides were negligible (0.01), indicating a fresh water environment (Ref. 7, pp. 19, 83, 84, 170; 23, pp. 151, 152, 226 through 237; 36, p. 61). The food chain bioaccumulation factor value that corresponds to the type of water body (i.e., fresh water) in which the Woodbury Creek fishery is located is used to assign the bioaccumulation potential factor value to the hazardous substances (Ref. 1, p. 51617).

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Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.4.2.2 Hazardous Waste Quantity

Source Number	Source Hazardous Waste Quantity (HWQ) Value (Section 2.4.2.1.5.)	Is source hazardous constituent quantity data complete? (yes/no)
1	17,240.00	no
2	76.30	no
3	>0	no

Sum of Values: 17,316
(rounded to nearest integer as specified in HRS Section 2.4.2.2)

The sum of values for source hazardous waste quantity factor values as determined in Section 2.4.2.2 of the documentation record corresponds to a value of 10,000 in Table 2-6 of the HRS. Therefore, the hazardous waste quantity factor value for the surface water pathway is 10,000 (Ref. 1, p. 51591).

4.1.4.2.3 Waste Characteristics Factor Category Value

One hazardous substance (PCBs) associated with waste sources that have a surface water pathway containment factor greater than 0 for the Lower Delaware River watershed corresponds to the maximum ecotoxicity/persistence factor value (10,000) and bioaccumulation factor value (50,000), as shown previously.

(Ecotoxicity/persistence factor value) x (hazardous waste quantity factor value) = 10,000 x 10,000 = 1×10^8

(Ecotoxicity/persistence factor value x hazardous waste quantity factor value)
x (bioaccumulation potential factor value) = (1×10^8) x (50,000) = 5×10^{12}

The product corresponds to the maximum Waste Characteristics Factor Category Value of 1,000 in Table 2-7 of the HRS (Ref. 1, pp. 51592, 51620).

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Hazardous Waste Quantity Factor Value: 10,000
Waste Characteristics Factor Category Value: 1,000

4.1.4.3 Environmental Threat - Targets

Actual Contamination of 0.16 mile of an HRS-eligible wetland and a habitat known to be used by a Federally-designated endangered species (Ref, 15, pp. 1, 2; 25, Figures 3 and 4).

Level I Concentrations
N/A

Level II Concentrations
Sample ID: T9-EA
Sample Medium: Sediment
Distance from the PPE1: 760 feet

Hazardous Substance	Hazardous Substance Concentration
Lead/PCBs	15,300 mg/kg / 8.3 mg/kg

Ref. 7, pp. 154, 160; 9, pp. 972, 1004; 15, p. 1; 25, Figure 3.

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1 Level I Concentrations

No Level I concentrations were documented. The Level I Concentrations Factor Value is 0 (Ref. 1, p. 51625).

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Level I Concentrations Factor Value: 0

4.1.4.3.1.2 Level II Concentrations

Sensitive Environments

According to the New Jersey Landscape Project, the Matteo property and environs are known to be used as foraging habitat for the Bald Eagle, a federally-designated threatened or endangered species (Ref. 24, pp. 1 through 3; 25, Figure 4).

Sensitive Environment	Distance from PPE to Sensitive Environment	Reference	Sensitive Environment Value(s)
Bald Eagle foraging habitat	0.00 mile	1, p. 51624; 24, pp. 1 through 3; 25, Figure 4	75

Sum of Sensitive Environments Value: 75

Wetlands

Wetland	Wetland Frontage	Reference(s)
Hessian Run - classified P- SS1/EM	0.16 mile	Ref. 15, pp. 1, 2; 25, Figure 2

Total Wetland Frontage: 0.16 mile
Wetland Value: 25

Sum of Sensitive Environments Value + Wetland Value: 100

The Level II Concentrations Factor Value is 100 (Ref. 1, p. 51625).

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Level II Concentrations Factor Value: 100

4.1.4.3.1.3 Potential Contamination

The Potential Contamination Factor Value is not scored (NS).

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Potential Contamination Factor Value: NS